

BLOOD CLOTTING

March 19, 2013 (David Cloud, Fundamental Baptist Information Service, P.O. Box 610368, Port Huron, MI 48061, 866-295-4143, fbns@wayoflife.org; for instructions about subscribing and unsubscribing or changing addresses, see the information paragraph at the end of the article)

Blood clotting is an example of a wonderful biological system that could not have evolved in stages.

The clotting mechanism is necessary for survival in animals and humans, because the blood circulation system is pressurized, and a simple cut or wound would prove fatal if the bleeding were not stopped.

Hemophilia is a life-threatening disease in which part of the clotting apparatus is crippled.

When a cut occurs, molecular signals cause various proteins to activate to create a complex meshwork that entraps the blood cells, forming the initial clot.

Clotting involves over 30 distinct individual reactions, each of which is vital to heal a wound and each of which is exceedingly complex. The coordination, order, timing, and rates of action must be exact. Omitting even one of the reactions, inserting an unwanted step, or altering the timing of a step would result in death.

This is why the blood clotting system is called “a cascade, a system where one component activates another component” (Alan Gillen, *Body by Design*, p. 74).

- * The clot must form quickly.

- * It must form the full length of the wound with sufficient coverage to stop the bleeding.

- * It must form only in the precise location of a wound and only enough to close the wound and not close down the blood vessels (otherwise it could block circulation, which is what causes heart attacks and strokes).

- * The wound must be cleansed of germs and damaged cellular tissues. This is accomplished by an increase in the flow of blood enriched with white blood cells.

- * The clotting process must not only stop the flow of blood but also develop a new skin cover for permanent healing. The surrounding skin cells increase the rate of reproduction to create a bridge of new skin.

- * At the precise time when healing is completed, other protein machinery must remove the clot.

The intricate process begins with the creation of a protein mesh to close the wound and trap the blood. It is composed of a protein called fibrinogen that is carried in the blood plasma. Another protein, thrombin, slices pieces of fibrinogen to create fibrin and connect them together to form a network. Long threads criss-cross the fibrin to entrap the blood cells.

Consider the amazing intelligence and communication that is involved throughout this process at the cellular level.

Russell Doolittle has tried to provide an evolutionary scenario for the blood clotting system, but biologist Michael Behe demonstrates that Doolittle’s scenario is simply a “just-so” story.

"What he has done is to hypothesize a series of steps in which clotting proteins appear one after another. Yet, as I will show in the next section, the explanation is seriously inadequate because no reasons are given for the appearance of the proteins, no attempt is made to calculate the probability of the proteins' appearance, and no attempt is made to estimate the new proteins' properties. ...

"The first thing to notice is that no causative factors are cited. Thus tissue factor 'appears,' fibrinogen 'is born,' antiplasmin 'arises,' TPA 'springs forth,' a cross-linking protein 'is unleashed,' and so forth. What exactly, we might ask, is causing all this springing and unleashing? Doolittle appears to have in mind a step-by-step Darwinian scenario involving the undirected, random duplication and recombination of gene pieces. But consider the enormous amount of luck needed to get the right gene pieces in the right places. ...

"The second question to consider is the implicit assumption that a protein made from a duplicated gene would immediately have the new, necessary properties. ...

"The third problem in the blood-coagulation scenario is that it avoids the crucial issues of how much, how fast, when, and where. Nothing is said about the amount of clotting material initially available, the strength of the clot that would be formed by a primitive system, the length of time the clot would take to form once a cut occurred, what fluid pressure the clot would resist, how detrimental the formation of inappropriate clots would be, or a hundred other such questions" (*Darwin's Black Box*, chapter 4).

The blood clotting system cannot have emerged piecemeal. Dean Kenyon, Ph.D. in biophysics from Stanford University, observes:

"In fact, having a primitive, poorly controlled clotting system would probably be more dangerous to an animal, and therefore less advantageous, than having no such system at all! ... It is important to realize that no one has ever offered a credible hypothesis to explain how the blood clotting system could have started and subsequently evolved. ...

"Virtually all biochemical systems, large and small, exhibit coherent integration of distinct parts to give a whole entity with a separate purpose. This includes photosynthesis, cell replication, carbohydrate, protein, and lipid metabolism, vision, the immune system, and numerous others. Like a car engine, biological systems can only work after they have been assembled by someone who knows what the final result will be" (Davis and Kenyon, *Of Pandas and People*, p. 145).

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